REMARKS

Reconsideration and allowance are respectfully requested.

After entry of this Amendment and Response, claims 16-21, 25-29, and 38-40 are pending. Claims 22-24 were previously canceled.

Claim 39 has been amended to replace "chimeric gene" with "recombinant DNA construct".

The paragraph beginning at page 21, line 5 of the specification has been amended to more clearly indicate that Figure 1 consists of Figure 1A-C.

Figure 1A-C has been amended to label the sequences with the correct SEQ ID NOs. The support for this correction is found in the paragraph beginning at page 2, line 33.

No new matter has been added.

Rejection of Claims 16-21, 25-29 and 38-40[1] under 35 U.S.C. 101

Applicants respectfully traverse.

The utility requirement is met if an asserted utility would be considered specific, substantial, and credible by a person of ordinary skill in the art in view of all the evidence of record. MPEP 2107 II (D) (8th ed. 2003).

Brady *et al.*, *Nature*, **343**: 767-770 (1990), disclosed in the specification on page 1 and filed with the IDS dated February 8, 2001, report crystallography studies of fungal triacylglycerol lipase (TGL) that showed several characteristic structural TGL features:

1. TGL has a trypsin-like catalytic triad ($S_{144} - D_{203} - H_{257}$). *Id.* at Figs. 1 and 3 and page 770.
2. TGL has a W_{88} that is the center of a long loop called a 'lid' for the catalytic center. *Id.* at Fig. 1.
3. in TGL from prokaryotes and eukaryotes, the active S is situated in a conserved motif ($G - X_1 - S - X_2 - G$), where X_1 is either H or Y. *Id.* at 770.

In the present application, Figure 1A-C discloses the sequence alignment of SEQ ID NOs:35, 36, 14, 18, and 20. The following diagram, a portion of the alignment of Figure 1A-C, illustrates to one of ordinary skill in the art that SEQ ID NO:14 contains the features of TGL described by Brady *et al.* (set forth in the preceding paragraph, 1. and 2.):

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[1] In the Office Action, the Examiner rejected claims 16-29 and 38-40. Since clams 22-24 were canceled in an Amendment and Response filed on September 25, 2002, Applicants assume that the Examiner meant claims 16-21, 25-29 and 38-40 in this and the following rejections.

Sequence in Brady : W_{88}---------- S_{144} ---------- D_{203}---------- H_{257}
SEQ ID NO:14: W_{129}----------S_{187}----------D_{259} ----------H_{317}
185 246 313

SEQ ID NO:14 has the identical motif (G-X_1-S- X_2-G, wherein X_1 is H and X_2 is Q), surrounding its active serine that is disclosed in Brady *et al.* set forth above, see 3. Furthermore, the G-X_1-S- X_2-G motif is conserved among the novel rice and soybean sequences disclosed in the present application and the known *Canis familiaris* and *Caenorhabditis elegans* sequences as shown in Figure 1B at alignment residues 185-190.

This S-D-H triad, lid structure, and the G- X_1-S- X_2-G motif have also been demonstrated by crystallography studies for human gastric lipase by Roussel *et al.*, (*J. Biol. Chem.* **274:**16995-17002 (1999) Figs. 1-2).

A Blast search was conducted by Applicants before filing the subject application using BLAST "nr" database specified in Example 2 of the specification. (See Appendix A, filed herewith). The Blast search using SEQ ID NO:14 indicated that the top ten polypeptide "hits" are lipases. Seven of the ten tested positive for lipase activity while the remaining three were not tested. Of the seven, five are TGLs and two are lysosomal acid lipases. Thus, the claimed sequences are similar to polypeptides with lipase activity.

Based on the foregoing remarks, the claimed invention has utility as supported by the structural features disclosed by Brady et al. and the similarity to the lipases for which activity has been shown as exemplified by the BLAST results.

The specification as filed discloses the utility of the claimed invention. See specification, page 13 for example:

> The nucleic acid fragments of the instant invention may be used to create transgenic plants in which the disclosed acid or neutral triacylglycerol lipases are present at higher or lower levels than normal or in cell types or developmental stages in which they are not normally found. This would have the effect of altering the level of triacylglycerol and cholesteryl esters in those cells. Accumulation of fatty acids with unusual structures may be a positive phenotype in plants used for foods. Triacylglycerol lipases may also be useful in processing of plant seed oils and the development of novel seed oils.

Further, Examples 5 and 6 of the specification provide for expression of TGLs in monocots and dicots, respectively. Carriere *et al.*, (1991) *Eur. J. Biochem.* **202**:

75-83, disclosed in the IDS filed April 19, 2001, teaches standard methods for measuring TGL activity.

In view of the foregoing remarks, the specification as filed meets the requirements for a specific, substantial, and credible utility in accordance with section 101. Thus, Applicants respectfully request reconsideration and withdrawal of the utility rejection.

Rejection of Claims 16-21, 25-29 and 38-40 under 35 U.S.C. § 112, first paragraph, utility

Applicants respectfully traverse.

The remarks to the section 101 rejection are incorporated herein by reference in their entirety for the sake of brevity. Further, Applicants submit that based on the specification as filed which includes a disclosure of the Brady reference (filed with the IDS dated Feburary 8, 2001) and the Carriere reference (filed with the IDS dated April 19, 2001), the specification as filed meets the requirements for a credible asserted utility or well established utility in accordance with section 112, first paragraph. In addition, one of ordinary skill in the art would have immediately recognized the utility of the claimed invention and, therefore, would have known how to use the claimed invention.

Applicants respectfully request reconsideration and withdrawal of this rejection.

Rejection of Claims 16-21, 25-29 and 38-40 under 35 U.S.C. § 112, first paragraph, enablement

Applicants respectfully traverse.

As discussed above in the remarks in response to the 101 rejection incorporated herein by reference for the sake of brevity, SEQ ID NO:14 has several structures that Brady *et al.* reported as indicative of TGL: the catalytic triad, the W residue located at the center of the "lid," and the conserved motif surrounding the active S. See Brady *et al.*, disclosed in the specification on page 1 and filed with the IDS dated February 8, 2001.

The claimed invention is directed to an isolated polynucleotide comprising: (a) a nucleotide sequence encoding a polypeptide having triacylglycerol lipase activity, wherein the polypeptide has an amino acid sequence of at least 80% sequence identity, based on the Clustal method of alignment, when compared to SEQ ID NO: 14; or (b) a complement of the nucleotide sequence, wherein the complement and the nucleotide sequence consist of the same number of nucleotides and are 100% complementary.

Thus, an isolated polynucleotide encoding a polypeptide having triacylglycerol lipase activity and 80% sequence identity to SEQ ID NO: 14 will have the characteristics disclosed by Brady et al.

Applicants are aware of the references cited by the Examiner describing potential pitfalls of *solely* relying on sequence comparison for predicting protein functions. However, the specification as filed in addition to Appendix A filed herewith overcome the suggestions of Doerks, TIG 14, no.6:248-250, June 1998, Smith et al., Nature Biotechnology 15:1222-1223, November 1997, and Brenner TIG 15, 4:132-133, April 1999 cited in the outstanding Office Action.

A Blast search using SEQ ID NO:14 conducted by Applicants before filing the subject application indicated that the top ten polypeptide "hits" are lipases, among which seven tested positive for lipase activity. The remaining three hits were not tested for activity. Of the seven, five are TGLs and two are lysosomal acid lipases. The search was conducted using BLAST "nr" database specified in Example 2 of the specification. (See Appendix A, filed herewith).

The claimed invention is enabled by the structural features disclosed by Brady et al. together with the similarity of SEQ ID NO: 14 to the lipases for which activity has been shown as exemplified by the BLAST results. Thus, the specification as filed together with Appendix A refute the contrary disclosures of the above-identified references cited in the outstanding Office Action.

Also, Applicants respectfully disagree with the Examiner's statement that "sequence similarity is not sufficient to determine functionality of a DNA coding sequence". (Office Action, p. 4). The Utility Guidelines expressly allow for utility to be established based solely on homology data. See Utility Guidelines, example 10. Applicants further submit that working examples are not required by the Guidelines.

Nonetheless, the knowledge of particular structural features required for conferring the function of triacylglycerol lipases provided by Brady et al., disclosed in the specification as filed, provide the enablement required in accordance with 112, first paragraph, which requirement is set forth in the outstanding Office Action, page 5, lines 7-11.

Thus, with the guidance provided by the specification, one of ordinary skill in the art would not have to perform undue experimentation to make and use the claimed invention. Therefore the claimed invention is clearly enabled.

Applicants respectfully request reconsideration and withdrawal of the non-enablement rejection.

Conclusion:

Applicants believe the foregoing to be responsive to each of the points raised in the Office Action. Allowance of the claims is respectfully requested.

A check is enclosed for the fees believed to be due. If the undersigned is mistaken in fee calculation, please charge any additional fees or credit any overpayment connected with this filing to Deposit Account No. 03-2775.

Respectfully submitted,

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